Supplementary Information

Nano-graphene oxide as a novel platform for monitoring the effect of LNA modification in nucleic acid interactions

Muhit Rana†, Mustafa Balcioglu†, Neil Robertson† and Mehmet V. Yigit †, ‡, *

†Department of Chemistry and RNA Institute,
University at Albany, SUNY,
1400 Washington Avenue, Albany, New York 12222, United States.

‡College of Nanoscale Science & Engineering,
University at Albany, SUNY,
257 Fuller Road, Albany, New York 12203, United States.

*Correspondence:
Tel: (1) 518-442-3002
myigit@albany.edu
**Figure S1.** Desorption of FITC-labeled miR-10b DNA on graphene oxide with anti-miR-10b DNA, LNA, and non-complementary oligonucleotides. The relative fluorescence (%) recovery at 5000 seconds, \((n=3)\).
Figure S2. Adsorption of FITC-labeled miR-10b DNA on graphene oxide and its desorption with complementary oligonucleotides with and without LNA modifications. Adsorption of FITC-labeled DNA was observed by a decrease in fluorescence, while release was observed as an increase with the addition of 10, 50, 100 and 200 nM of (a) anti-miR-10b DNA or (b) anti-miR-10b LNA, (n=3).
Figure S3. Real time denaturation of DNA:DNA and DNA:LNA duplexes. The melting curves of miR-10b DNA and anti-miR-10b (a) DNA (red curve) and (b) LNA (blue curve) duplexes were observed by monitoring the OD value at 260 nm with UV-Vis spectroscopy.
Figure S4. Complementary oligonucleotide with or without LNA modification induced desorption of FITC labeled miR-10b DNA at 70 °C. Oligonucleotides with LNA base modification induce greater release of complementary miR-10b DNA on graphene oxide due to higher duplex stability. Release after an hour is quantified by fluorescence measurements, (n=3).
Figure S5. Complementary oligonucleotide with or without LNA modification induced desorption of FITC labeled miR-10b DNA on graphene oxide surface at (a) 65 °C and (b) 75 °C.
Figure S6. Desorption of FITC-labeled miR-10b DNA, mutated DNA with a single base mismatch and non-complementary DNA on graphene oxide using oligonucleotides with or without LNA modifications. Hybridization-induced desorption is monitored with anti-miR-10b (a) DNA and (b) LNA. The relative fluorescence (%) recovery at 5000 seconds, (n=3).